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Cruise Report

R/V JAMES M. GILLISS, GS 7903-4

27 June - 11 July 1979

James M. Robb
U. S. Geological Survey
Woods Hole, MA 02543

Vessel: R/V JAMES M. GILLISS

Cruise Number: GS 7903-4

Project: Mid-Atlantic Outer Continental Shelf Environmental Assessment (BLM)

Area of Operations: Continental Slope (200 m to 2,000 m depth) off New Jersey.
BLM Mid-Atlantic OCS Area.

Dates: Leave Woods Hole 1300 27 June 1979

Arrive Norfolk, VA 0830 11 July 1979

Scientific Party:

James Robb, Chief Scientist, USGS
David Twichell, Watchstander, USGS
John Hampson, Watchstander, USGS
W. Mack Ferrebee, Watchstander, USGS
Lawrence Poppe, Watchstander, USGS
Steven Schertzer, Watchstander, USGS
F. Mitchell Hill, Watchstander, USGS
Lester North, INS Navigation, USGS
Alan Goodman, Technician, USGS
Gerard McCarthy, Technician, USGS
John Larson, Technician, USGS
Barry Irwin, INS Navigation, USGS
James Dodd, INS Navigation, USGS
Michael Goldstein, INS Navigation, USGS

[Robert Hagan, Master, R/V GILLISS]

Purpose of Cruise:

High resolution seismic profiling of continental slope to study potential geologic hazards to exploration and development--specifically, bottom instability due to slumping or sliding.

Navigation Techniques:

USGS Western Integrated Navigation System: includes satellite, rho-rho Loran-C, hyperbolic Loran-C, gyro compass, doppler speed log, and other inputs. Prime navigation sensor used was rho-rho Loran-C (9960 chain) with satellite updates.

Scientific Equipment--Data Acquisition Systems:

40 cubic inch airgun with wave shaper
Teledyne minisparker
3.5 kHz, hull mounted echo sounding system
O.R.E. side scan
experimental deep hydrophone device
Lacoste-Romberg and Bell gravity meters
Geometrics marine magnetometer

Tabulated Information:

Days at Sea: 14

Amounts of Data Acquired:

Airgun	(840 n. miles)	1555 km
Minisparker	(945 n. miles)	1750 km
3.5 kHz	(960 n. miles)	1780 km
Side Scan	(38 n. miles)	70 km
Deep Hydrophone	(58 n. miles)	105 km
Gravity	(1385 n. miles)	2565 km
Magnetics (total field)	(820 n. miles)	1520 km

Narrative and Comments:

Departed Woods Hole 1300 EDT, 27 July 1970; commenced seismic operations 1000 EDT, 28 July. Seismic line numbering for this cruise starts with line 51, to continue a numbering sequence begun last year in this area of the continental slope with ISELIN, CI 7807-1. Seismic operations ceased 0945 10 July, with line 115, and the GILLISS berthed in Norfolk at 0830 EDT, 11 July. Weather was excellent and seas were nearly calm throughout our operations, with the exception of rain and a two or three foot sea on the evening of 3 July.

Magnetic intensity was recorded between 1430 EDT 29 June and 0645 EDT, 10 July, with breaks during side scan and deep hydrophone work. Gravity data were recorded port to port.

The majority of the data were acquired on a 1/2 by 1 nautical mile grid over the continental slope extending over a 13 n. mile section between Carteret and South Toms Canyons. These data extend and augment data from last year's ISELIN cruise, CI 7807-1. All data appear to be excellent with only small gaps for normal equipment maintenance and minor failures.

Navigation was directed and recorded by the USGS WINS group, who did a marvelous job.

Side scan data were acquired along several NE-SW lines (long-slope) in 300 to 600 meters of water over what appeared to be the upper limits of topographic roughness on the slope (i.e., top of unstable (?) area). The side scan was

operated at 1/2 sec sweep (per side) with the fish about 40 meters (±40 m) off the bottom. A number of features were observed which have yet to be mapped and interpreted. The slow speeds (1 to 2 knots) required to keep the fish near the bottom limit the area that can be covered, but the GILLISS performed very well and evinced few problems maintaining track.

The deep hydrophone experiment was a refreshingly successful attempt to enhance horizontal resolution of seismic data (minisparker in this case) by streaming a single hydrophone on the side scan cable at a depth close to the bottom but above the bottom relief. We ran two lines across the mid-slope. The deep hydrophone gave very clear records, and appears to be a very useful technique that can be improved with a few refinements.

On 9 July we took an hour's excursion for a photo opportunity and to pay our respects to the Dar Pomorza, a Polish full-rigged training ship who crossed our track under full sail.

We received excellent and friendly cooperation from Captain Hagan and the entire crew of the GILLISS. The ship performed very well and held to our planned tracks well within the unusually stringent requirements of slow speed and tight navigation.

Note for the Record:

About 1030 9 July 1979 the GILLISS received a radio call from the lobster boat, Heather Ann, who suggested that our gear may have severed some lines to his lobster traps. Captain Hagan pointed out to the lobsterman that our gear is streamed no deeper than about 20 feet and that we carefully avoid buoys. He had called us several days previously (see GILLISS Log) to inquire about our activities and had given us his pot line location. Heather Ann then inquired about our side scan sonar as a bottom towed device. Captain Hagan told him that our side scan lines were well down the continental slope in deep water, away from his trap line.

The tone of the conversation implied that this fisherman may be considering a claim for damages.

Inspection of our track lines reveals that our closest approach to any of his pots with any deep towed gear was about 1.8 miles. Our towed gear consists of two linear hydrophone arrays sheathed with lightweight plastic tubing, a magnetometer head buoyed near surface with a float, a lightweight-plastic-sheathed sparker cable, and an airgun towed off the stern at about 20 foot depth. Draft of this ship is about 15.5 feet.

Our gear could easily be damaged by contact with any pot lines or long lines. We noted no damage or unusual strains. The captain and mates kept close lookout and commonly plotted buoys to give them wide berth. There is no basis for a damage claim due to GILLISS operations. We did, however, note 12 to 15 large sterm trawlers operating on the outermost continental shelf a few miles to the southwest of this immediate area during this time.

TRACKLINE JAMES GILLISS GS7903-4 JUN-JUL 1979